CHAPTER 2 - INVENTORY OF EXISTING CONDITIONS

OVERVIEW

The first step in the airport master planning process involves gathering information about the airport and its environs. An inventory of current conditions is essential to the success of a master plan, since the information also provides a foundation, or starting point, for subsequent evaluations.

The inventory of existing conditions for the GON AMPU includes the following information:

- Information pertaining to airport ownership and management, the general airport setting, transportation access, the airport's relationship to the Federal airport system, and airport history
- Population and socioeconomic information for the geographic area where most of the passengers are coming from
- A review of historic and current airport activity, including commercial service, general aviation, and military activity
- An overview of the area's airspace, air traffic control (ATC) management, and obstructions
- Descriptions of facilities and services now provided at the airport including a general description of airside, terminal, landside, and support facilities, as well as utilities and other infrastructure
- A summary of environmental conditions at the airport
- A financial analysis including historic revenue and expenses

The information gathered for this portion of the Master Plan, to the extent possible, is current as of the end of 2010, the base year for this study. Whenever possible, data was revised right up until the day this report was printed. Updated information was gathered throughout the development of the Master Plan and will be included in subsequent chapters.

Appendix 1 contains terms and abbreviations common to the aviation industry, but possibly nebulous to outsiders not familiar with airports and aircraft. To avoid defining each term throughout this document, readers not familiar with them should refer to this glossary.

AIRPORT OWNERSHIP AND MANAGEMENT

Groton-New London Airport, one of twenty-three current public use airports in the state, was established as the first State of Connecticut airport in 1929. Originally called Trumbull

Airport after Governor Jonathan Trumbull, airport ownership was transferred to the United States Navy during World War II. After World War II, the Navy returned the airport to the State of Connecticut, and in 1980, the name of the airport changed to Groton-New London Airport.

The airport is owned and operated by the State of Connecticut, through the Connecticut Airport Authority (CAA) and Connecticut Department of Transportation (CTDOT). The funds necessary to operate Groton-New London Airport come from the Connecticut State Transportation Fund. Likewise, revenue derived from the airport is returned to the Transportation Fund.

The airport is currently budgeted to employ a full time manager with a staff of four full time employees and a part time fire captain, along with seasonal assistances from CTDOT as necessary.

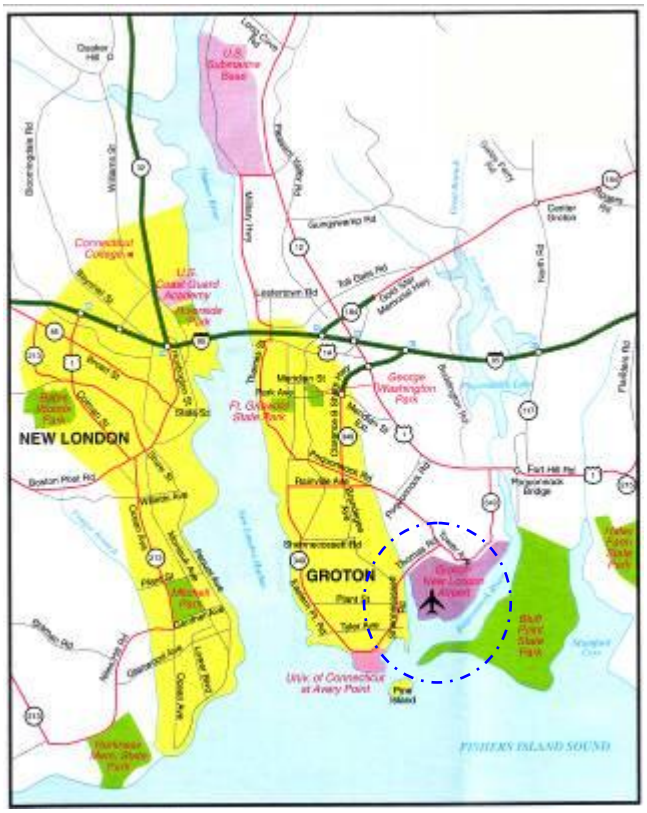


Figure 2.1 - Airport Location Map

AIRPORT LOCATION AND ROLE

As shown on Figures 2.1 above and 2.2 on the next page, GON is situated on approximately 489 acres in the town of Groton, Connecticut, along the Poquonnock River, at an average elevation of nine feet above mean sea level (MSL). The airport is located approximately seven miles driving distance southeast of downtown New London and 55 miles southwest of Providence, Rhode Island. The airport is bounded by Interstate 95 to the north and Long Island Sound to the south.

Groton-New London Airport is classified as a general aviation/commercial airport in the Federal Aviation Administration National Plan of Integrated Airports System (NPIAS). Of the 23 public use airports in Connecticut, 14 are in NPIAS. The remaining nine are privately owned and not (generally) eligible for inclusion in NPIAS or eligible for Federal funding. The other airport classifications within NPIAS are commercial service and reliever facilities. Within the state, two airports are commercial facilities (Tweed - New Haven and Bradley International Airports), three airports are relievers (Danbury Municipal, Hartford-Brainard, and Robertson Airports), and the remaining airports are general aviation.

When the last AMPU was developed in 1999, GON was a commercial service – primary airport. Commercial air service required to sustain this classification was withdrawn in 2003 when U.S. Air stopped operations. Since then the airport's classification was officially changed by the FAA. However, CTDOT/CAA will continue to maintain the airport to commercial airport standards, known as Part 139, in part to help keep the airport poised for the possible return of commercial service. Part 139 is discussed in more detail in Appendix 2.

Figure 2.2 – Aerial View of GON and Surrounding Property

It is important to note that the general aviation classification does not restrict other types of activity from occuring at the airport. GON does handle considerable military operations, and an occassional commercial flight; but for the most part, the airport almost exclusively handles general aviation aircraft and activities.

SERVICE AREA

The service area for an airport defines the region that the airport serves. The size of this area can vary depending upon the local population distribution, transportation infrastructure, and geography. An airport may also have several service areas, depending upon the activity that occurs at the facility, such as commercial, air cargo, or general aviation activity.

The 1999 AMPU studied two different methodologies. One method, called the isochrone method, determines the service area based on a specific driving time to the airport. The second method identifies other comparable airports and to define the overlap point of their services areas to Groton's. In the end, the last AMPU relied on the latter technique,

The first technique used in the 1999 study was the isochrone method; which applied a 60-minute drive time in the analysis. This methodology resulted in a fairly large service area that extended northeast along I-95 to Providence, north along I-395 to an area just south of the Massachusetts state line, northwest along Highway 9 to Hartford, and southwest on I-95 to New Haven. The comparable airports method, which was eventually adopted in the

previous report, resulted in a much smaller service area; one that represented an approximate 30 minute drive to GON.

While the airport's role has changed since the last study, following the loss of commercial traffic, it was concluded that the service area adopted in 1999 is still applicable today; meaning the majority of people using GON are willing to drive on average, up to 30 minutes. Beyond 30 minutes, other airports, both commercial service and general aviation are readily available. Thus, for the purposes of this report, the primary Service Area for the airport extends north to Norwich and southeast to Old Saybrook in southeastern Connecticut, and northeast to a point midway to Providence. The Airport Service Area includes New London County in Connecticut, and the southwestern corner of Washington County in Rhode Island which includes primarily the town of Westerly.[1]

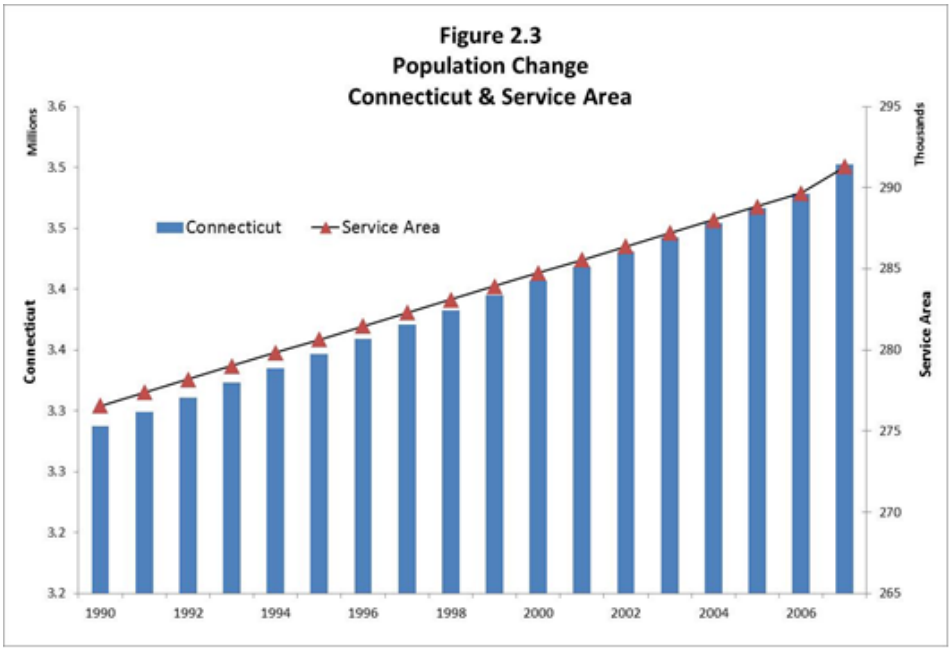
SOCIOECONOMIC DATA AND ECONOMIC DEVELOPMENT

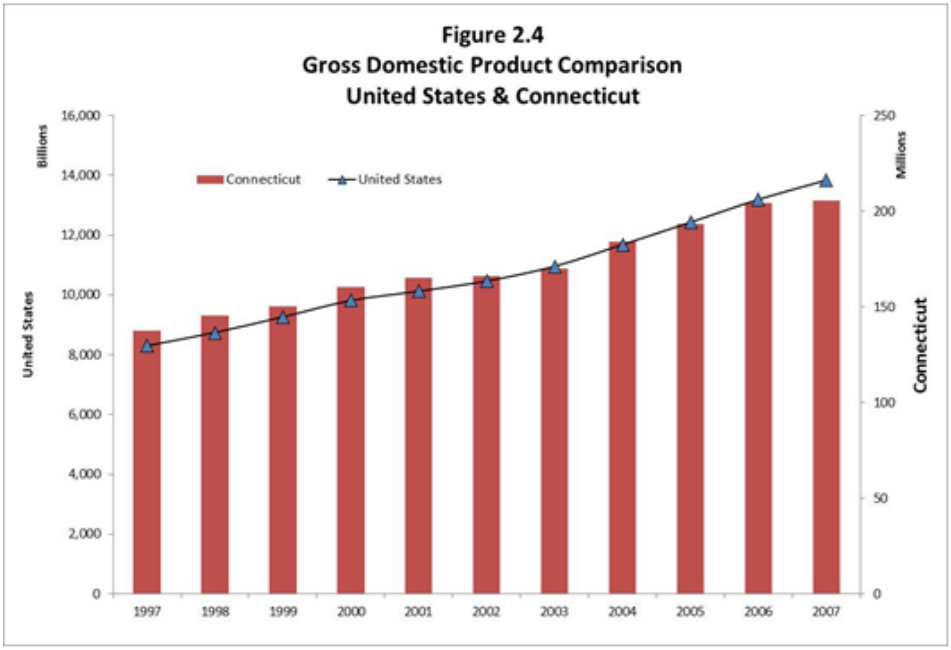
Socioeconomic characteristics such as population and economic conditions provide insights concerning an area's historic and future growth. Moreover, socioeconomic characteristics usually have a positive relationship to aviation activity and are often useful tools in preparing estimates of future airport activity. For an airport master plan, socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the geographic area served by the airport. This information is typically used in forecasting aviation demand. Presented in this report are population and Gross Domestic Product (GDP)[2] changes.

U.S. Census data from New London County was combined with the Westerly subset of Washington County in Rhode Island to produce a population set for the Service Area. We compared this data with growth trends in Connecticut and the United States. For consistency, we analyzed data during the period 1990 through 2007. Both 1990 and 2000 were census years; data for 2007 was estimated based on U.S. census growth models for the United States and our own for the Service Area a straight line linear trend was used).

[1] Data is for the town of Westerly as defined by the U.S. Census as a subdivision of Washington County.
[2] Real gross domestic product -- the output of goods and services produced by labor and property located in the United States.

There is little argument that the population in the United States continues to migrate from the northern states into the U.S. Sunbelt. During the 18-year period, the U.S. population grew by 21.8 percent; but Connecticut grew by only 6.3 percent; and the Service Area slightly less at 5.3 percent. The Rhode Island component of this growth was actually higher percentage wise; possibly, because of the more rural character, which is consistent with recent urban sprawl trends. Figure 2.3 provides a comparison of Connecticut's and the Service Area's population change. Figure 2.4 presents the historical GDP for the United States and Connecticut during the period 1997 to 2007.[3] The key to the GDP data is the consistency between the national and state growth rates.





[3] United States Bureau of Economic Analysis.

AIRPORT CERTIFICATION

A component of this AMPU is an examination of the nature and purpose of the current and future application of commercial airport certification at Groton-New London Airport. A separate report is contained in Appendix 2 of this paper.

The Appendix 2 report describes the purpose of commercial airport certification requirements, under 14 CFR 139, Certification of Airports (Part 139), and the current and future requirement for certification at GON. It is an essential determination because it defines the classification of GON, which determines a wide-range of administrative, safety, and operational requirements required at commercial service airports. Included in the report is an analysis of the airport's existing Airport Rescue and Fire Fighting (ARFF) index, equipment, and work force requirements.

EXISTING AIRPORT FACILITIES

Airports are divided into two main areas; airside and landside. The airside area consists of the parts of the airport that accommodate the movement of aircraft (runways, taxiways, parking aprons). The airside also includes the navigational and communication equipment designed to facilitate aircraft operations, navigation aids, lighting systems, antennae, etc. Landside facilities include the terminal/administrative building, hangars, and other support buildings, auto parking, access roads, and supporting infrastructure/utilities. The landside includes support-related facilities for utility delivery, aircraft fire fighting, and airport operations, such as snow removal, maintenance, and airport management facilities.

Figure 2.5 (next page) is an aerial photograph of the airport taken in January 2012; and Figure 2.6 (page 10) is the Existing Airport Layout Plan.

Figure 2.5 – Airport Aerial Photo (December 2011)

Insert Figure 2.6 – Existing Airport Layout Plan

CRITICAL DESIGN AIRPLANE

The critical design aircraft is defined as the listing of airplanes (or a single airplane) with the fastest approach speed and longest wingspan, and has at least 500 annual operations for an individual airplane or a family grouping of airplanes.[4] Generally, the existing critical design airplane is carried over from the previous study's preferred or proposed ALP. However, because the critical design aircraft in 1999 was based on air carrier operations by U.S. Air (then U.S. Airways), which no longer operates at GON, selection of a new "existing" design aircraft is required.

In the 1980s, the FAA adopted a new classification system called Airport Reference Code (ARC) to group aircraft based on aircraft size (wingspan) and approach speed for design standards. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the airplane design group and relates to airplane wingspan or tail height (physical characteristics), whichever is the most restrictive. Generally, runways standards are related to aircraft approach speed, airplane wingspan, and designated or planned approach visibility minimums. Taxiway and taxilane standards are related to airplane design group.

Airport design first requires selecting the ARC(s), then the lowest designated or planned approach visibility minimums for each runway, and then applying the airport design criteria associated with the airport reference code and the designated or planned approach visibility minimums.

The 1999 AMPU did not list a specific critical design aircraft, but rather indicates it was a grouping of airplanes with a wingspan between 79 and 117 feet, and an approach speed between 121 and 141 knots (139 – 162 miles per hour). This aircraft is similar to a Fokker F-27, SAAB SF 340, and McDonnell-Douglas DC-9; U.S. Air used the latter just before they ceased operations at GON.

Determining the current critical design aircraft requires an analysis of current and recent past history operations to determine which aircraft, or grouping of aircraft meet the definition described earlier. However, aircraft operational data about specific aircraft make and models is not realistically possible at U.S. airports because there is no single agency or organization that maintains this type of data. Raw operational numbers are maintained by the air traffic control tower, which does sort by aircraft category (general aviation, air carrier, air taxi, and military), but not by specific make and model (Cessna Skyhawk, Embraer 120, Gulfstream IV, etc.). Therefore, an alternative method of determining which aircraft is the critical aircraft is required.

[4] AC 150/5325-4B, Runway Length Requirements for Airport Design, paragraph 102.

The FAA Enhanced Traffic Management System Counts (ETMSC) are flight counts designed to provide information on traffic counts by airport (or by city pair) for various data groupings such as aircraft groups, such as general aviation, military, large, medium, and small aircraft categories, etc. In addition, this data does break aircraft out some aircraft operations by type; which is the data needed to determine the critical design aircraft. The data provided by "type aircraft" includes aircraft on a filed flight plan, regardless of size, category, or type of flight (instrument or visual flight rules).

In analyzing the ETMSC data only two aircraft exceeded the minimum 500 annual itinerant operations required to qualify as the critical design aircraft; the Embraer 135 (EMB-13) and the Cessna Citation Model 650. Early in the study the EMB-135 was clearly the most widely used aircraft at GON because of it extensive use by the Pfizer Corporation. However, as the Master Plan unfolded, Pfizer relocated its local operations, and consequently, use of the EMB-135 at GON declined. By 2008 the company ended its EMB-135 operations at GON. This change resulted in the need to reevaluate the current design aircraft.

Figure 2.7. Cessna 650 Citation VIII

Discussions with airport management and air traffic control personnel at GON in 2011 indicated that the Cessna 650 was clearly the most widely used aircraft in the size (wingspan) and weight class required to meet the design aircraft requirements. Thus, the design (critical) aircraft for GON and one that establishes the ARC is the Citation 650. Figure 2.7 is a photograph of a typical 650. This aircraft has an average approach speed of 120 knots, placing it in Approach Category "C", and a wingspan of 53.6 feet, putting it in Design Group II. This data makes C-II the current ARC for the airport. However, this C-II classification is not consistent with the current ALP, which cites the ARC as C-III. Conversely, given the fact that airline service was discontinued at GON - operations that played a major role in the higher ARC classification - reducing the ARC from C-III to C-II is reasonable and justified.

In addition to selecting the design aircraft for the airport, selecting an additional aircraft as the critical design aircraft for the shorter crosswind runway and small aircraft parking aprons and hangars is prudent. This option allows planners to fine tune designs for Runway 15-33 and to design smaller, more compact facilities for small recreational aircraft. After analyzing available data, the design aircraft for the crosswind runway (15-33) is the Beech King Air 200, a B-II ARC aircraft. In addition the Cessna Skyhawk (C172), an A-I design aircraft is selected for small apron designs.

In summary, the recommended design aircraft and ARC for existing conditions at GON are:

Runway/Facility	Aircraft	ARC
5-23	Citation 650	C-II
15-33	Beech King Air 200	B-II
Small Aircraft Parking	Cessna 172	A-I

DESIGN CRITERIA

Design criteria identify key characteristics of the airport based on FAA design standards. As discussed in the previous paragraph, the existing airport design aircraft has the characteristics of an ARC C-II aircraft. Planners and designers use this data in establishing required airport sizing of various airport surfaces; both the width of runways and taxiways, and separation around them, and other components of the airport, such as runway safety area size, the distance buildings must be from runways and taxiways, etc.

Table 2.1 lists the principal airport surface and the existing design criteria. Airport surface definitions are contained in Appendix 1.

Table 2.1 - Airport Design Surfaces

Surface	Runway	Required Size	Remarks
Runway Safety Area	5	500' W x 1,000' L	EMAS Installed
	23	500' W x 1,000' L	EMAS Installed
	15	150' W x 300' L	Displaced threshold required to meet full RSA
	33	150' W x 300' L	298' long with displaced threshold
Runway Object Free Area	5	800' W x 1,000' L	
	23	800' W x 1,000' L	
	15	500' W x 300' L	
	33	500' W x 300' L	
Runway Protection Zone	5	1,000' Inner-Width 1,750' Outer-Width 2,500' Length	
	23	1,000' Inner-Width 1,750' Outer-Width 2,500' Length	
	15	500' Inner-Width 700' Outer-Width 1,000' Length	Encompasses a railroad line and vacant land north and south of Thomas Road
	33	500' Inner-Width 700' Outer-Width 1,000' Length	

RUNWAYS

Groton-New London Airport has two paved runways: Runway 5-23 and Runway 15-33. Table 2.2 lists each runway and there identifying characteristics. Figures 2.5 and 2.6 presented earlier on pages 10 and 11 show the runway layout.

Table 2.2 - Runway Data

Data	Runway 5	Runway 23	Runway 15	Runway 33
Runway Length	5,000 feet		4,000 feet	
Runway Width	150 feet		100 feet	
Construction	Bituminious concrete		Bituminious concrete	
Load Bearing Capacity	Single Wheel: 90,000 lbs. Dual-Wheel: 113,000 lbs. Dual-Tandem: 200,000 lbs.		Single Wheel: 90,000 lbs. Dual-Wheel: 113,000 lbs. Dual-Tandem: 200,000 lbs.	
Pavement Condition	Excellent		Excellent	
Runway Edge Lights	High Intensity		High Intensity	
Displaced Threshold	No	No	Yes - 230'	Yes - 205'
Visual Approach Guidance Lights	No	PAPI	No	PAPI
Runway End Identifier Lights	No	Yes	No	Yes
Approach Lights	MALSR	No	No	No
Part 77 Approach Slope	50:1	34:1	20:1	34:1
Approach Procedures	ILS, VOR, GPS	VOR, GPS	Visual	GPS

TAXIWAYS

The airport has a system of eight taxiways, providing access to/from both runways and the airport's landside. Figure 2.6 (presented earlier on page 10) shows each taxiway and the identifying characteristics.

AIR NAVIGATION SYSTEMS

This paragraph addresses navigation systems; specifically electronic navigation aids (NAVAIDS). Visual navigation aids are addressed on page 15 (see *Aeronautical Lighting*).

Electronic NAVAIDS at GON consist of the Very High Frequency Omni-Directional Range (VOR) and Instrument Landing System (ILS). The Global Positioning System (GPS), because it is not a land-based navigation aid, is not considered for the purposes of the AMPU.

- The **VOR** is located in a triangular unpaved section of the airport bounded by the approach end of Runway 15 and an abandoned runway and an internal access road (refer to Figure 2.6 presented earlier on page 10). The VOR, is owned and maintained by the FAA and operates on frequency 110.25 MHz. The system has no restrictions. The VOR, which includes Distance Measuring Equipment (DME) capability, provides enroute coverage for multiple airways (see Appendix 1), in addition to approach, or terminal coverage to Runways 5 and 23 at GON.

- **ILS**, with Category I minimums (see Appendix 1), is provided to Runway 5. The System consists of two primary components, a glide slope and the azimuth antenna. The glide slope antenna is located on the left side of the runway, 796 feet from the threshold, and is set at 3.0 degrees. The azimuth antenna is located on the departure end of Runway 5, approximately 1,000 feet from the approach end of Runway 23. The System is supported by an approach lighting system addressed in section 1.5.1.6. Figure 2.6 (presented earlier on page 10) shows the location of the ILS glideslope and localizer antennas.

AERONAUTICAL LIGHTING

This paragraph addresses aeronautical lighting. All aeronautical lights are consistent with FAA guidelines and Part 139 standards. All lights, with the exception of the rotating beacon, are controlled from both the air traffic control tower, and by Pilot Controlled Lighting (PCL) (see Appendix 1). Tower controllers turn lights on and off, and adjust the intensity as required by conditions (nighttime, weather, visibility) during hours of operation; during other times, pilots using a PCL system control lights. The tower controls the rotating beacon, which operates during nighttime and instrument meteorological conditions. The lights are in good condition and working order.

- **Runway Lights**. Elevated high intensity runway edge lights (HIRL) are installed on both runways.
- **Threshold Lights**. Threshold lights are installed on all four-runway ends. Runway 15-33 has flush mounted lights; Runway 5-23 has elevated lights.
- **Runway End Identifier Lights** (REILs) are installed on Runway 23 and 33 only.
- **Approach Lights**. A 1,400 foot medium intensity approach lighting system with runway alignment indicator lights (MALSR) is installed on Runway 5. The system extends into Baker Cove off Fishers Island Sound.
- **Visual Glideslope Indicators (VGSI).** There are two types of VGSI are installed at GON; PAPI and VASI (see Appendix 1).
  - **Runway 5** is equipped with a four-light PAPI on the left side set at the optimum 3.0 degrees, which corresponds to the ILS glide slope.

- **Runway 33** is equipped with four-light PAPI on the left side set at 3.5 degrees. The higher angle provides obstacle clearance over trees on Pine Bluff State Park, which also accounts for the displaced threshold.
- **Runway 23** is equipped with a four-box VASI on the left side, set at 3.0 degrees.
- **Runway 15** has no VGSI.

- **Taxiway Lights.** All taxiways are equipped with medium intensity elevated blue edge lights.
- **Rotating Beacon.** The airport's Beacon is a standard land airport (white-green light) located atop the control tower (Figure 2.8).

Figure 2.8

AIRPORT SIGNS

Airport signage consists of location, direction, destination, perimeter roadway, and information signs (see Figure 2.9 as an example), which are installed according to FAA standards. All signs are noted on the Airport Sign and Marking Plan.

AIRPORT PAVEMENT MARKINGS

Airport pavement markings consist of runway, taxiway, and apron markings. All markings at GON are consistent with FAA guidelines, including "enhanced" runway and taxiway markings for a Part 139 airport.[5] The markings are all in excellent to good condition. The majority of pavement markings are repainted annually.

Figure 2.9

Markings for runways and a helicopter landing area are white. Markings for taxiways, areas not intended for use by aircraft (closed and hazardous areas), and holding positions (even if they are on a runway) are yellow.

[5] Per FAA Advisory Circular 150/5340-1J, *Standards for Airport Markings*.

The following lists GON pavement markings.

- **Runway 5-23**. Runway 5-23 is the primary instrument runway with precision markings that consist of white:
  - Runway designation,
  - Runway centerline,
  - Runway threshold,
  - Runway Aiming Point,
  - Runway Touchdown Zone,
  - Runway Side Stripe, and
  - Yellow overrun chevrons on both ends.

- **Runway 15-33**. Runway 15-33 is designed a non-precision runway with equivalent markings, that consist of white:
  - Runway designation,
  - Runway centerline,
  - Runway threshold,
  - Arrows and arrowheads used to identify a displaced threshold on both ends
  - Runway threshold bar.

- **Taxiways**. Taxiway markings are also consistent with FAA guidelines and Part 139 regulations. All taxiways have yellow centerline and edge markings. Runway hold position markings are enhanced with black borders. Taxiway C has Hold Position Markings for ILS operations. Both runways have enhanced hold markings for use when one runway is used as a taxiway.

- **Aprons**. Aprons are marked with both lead-in centerlines and aircraft parking designations.

- **Movement and Non-Movement Areas**. The terminal area non-movement area is clearly separated and marked with a yellow on black background non-movement area boundary markings. The entire terminal apron area, from the northeast apron around the terminal apron and up to the TASMG[6] apron is marked with vehicle roadway markings.

- **Security Markings**. The terminal apron is marked with security identification display area (SIDA)/airport security area (ASA) boundary markings.

[6] 1109th Theatre Aviation Sustainment Maintenance Group.

- **Helipad.** The airport's only helipad, located on Taxiway C directly across from the terminal building and control tower, is marked with a standard white [H]. Other than taxiway lights, the helipad is not lighted.

APRONS

Aircraft aprons/ramps consist of seven specific parking areas joined by continuous pavement that extends throughout the airport's entire northern quadrant, from the approach end of Runway 15 to the end of Runway 23. The seven aprons, some of which are combined, consist of approximately 547,000 square feet of paved space, of which all but 10,000 is available for non-military use. The aprons are generally in excellent shape; well marked with lead-in taxiway and taxilane markings, as well as a designated vehicular designated roadway that extends parallel to Taxiway C along the majority of the outer perimeter of the aprons from the T-Hangar Ramp across the Terminal Ramp.. Refer to Figure 2.6 (page 10). The specific areas include:

- **Military Ramp.** The Military (MIL) ramp is for the exclusive use of the TASMG[7]. The apron measures 200 by 500 feet for a total area of 100,000 square feet.
- **General Aviation Ramps.** There are two general purpose GA ramps used for both based and itinerant aircraft parking. The first ramp is contained along Taxiway B with a single entrance and exit point onto Taxiway H. It accommodates 22 parked aircraft. This area measures 140' by 550' for a total area of 77,000 square feet. The second general aviation ramp accommodates six aircraft and is located off Taxiway C opposite Taxiway E. Both ramps contain in-ground tie-down rings and painted parking lines with spot numbers.
- **Central Ramp.** The central ramp is centrally located between the terminal and ARFF ramps. This apron is used by both transient and based aircraft as well as flight schools operating in the terminal. Total square footage is 280,000 sq feet and leads directly onto Taxiway C. The tie-down parking portion of the ramp measures 150'by 400', or 60,000 square feet. It accommodates 11 single and multi-engine planes with in-ground tie-down rings, painted parking lines and spot numbers.
- **Northeast Ramp.** The northeast ramp extends from the northeast end of the terminal ramp along Taxiway C to the approach end of Runway 23. However, the primary parking area is immediately adjacent to an automobile parking area between the terminal building 155 and ARFF facility, building 165. This apron is used by both transient and based pilots, as well as a flight school operating out of

[7] TASMG is a component of the Connecticut Army National Guard. TASMG's mission is to provide limited depot level maintenance and back-up aviation intermediate maintenance (AVIM) to Army National Guard aviation facilities in 14 northeastern states from Maine to Virginia to Ohio as well as the District of Columbia..

the terminal. The active portion of the ramp measures 150 by 400 feet, or 60,000 square feet.

- **Columbia Air Service Ramp.** The Columbia Air Service ramp is used exclusively by Columbia Air Service for based and itinerant aircraft parking, and often has large corporate aircraft parked or being serviced on the ramp. This ramp measures 160 by 620 feet (99,200 square feet).
- **Lanmar Ramp.** The Lanmar ramp is used exclusively by Lanmar Aviation for based and itinerant aircraft parking, and like Columbia, often has large corporate aircraft parked and being serviced on the apron. This ramp measures approximately 162 by 370 feet, or 61,000 square feet.

TERMINAL BUILDING

The terminal building is centrally located on the airport and is relatively unchanged since the last AMPU (see Figures 2.10 and 2.11). Constructed in 1963, it remains structurally sound, but underutilized. Renovations in 1997 included a new roof, a new heating and ventilation air-conditioning system, Americans with Disabilities Act compliance, new carpeting, and other improvements.

Figure 2.10 – Terminal Building (Landside)

Figure 2.11 – Terminal Building from Airside

The building is primarily single story, with a small second story that houses the airport administrative offices only. The building has an area of 10,593 square feet including the small second floor. The first floor contains two restrooms (men's and women's). Approximately 80 percent (9,500 square feet) of the building is available for commercial use, which includes a kitchen and restaurant.

In addition to airport management, current tenants include Avis/Budge Rental Car, Coastal Air Inc. and Action Multi-Ratings flight school. The terminal building is open from 7 am – 6 pm daily to accommodate tenant business hours. There are also two public pedestrian entrances from the roadway curbside and two airline passenger gate entrances to the terminal ramp.

FIXED BASED OPERATOR (FBO) FACILITIES

There are two FBOs located at the airport; Columbia Air Service and Lanmar Aviation. The layout of the two FBOs as well as the other general aviation facilities is depicted on Figure 2.6 (page 10).

Both FBOs sell AVGAS and Jet A fuel and maintain fuel farms and mobile refueler trucks for this purpose. Lanmar also maintains a 24 hour pilot self-service AVGAS fueling system.

Columbia Air Services

Columbia's facilities consist of four separate buildings totaling 66,000 sq. feet. The buildings comprise three conventional hangars used for aircraft storage and maintenance. One hangar also contains a counter and small seating area for air shuttle customers. The fourth building, opened in 2004, is a passenger terminal designed primarily for corporate customers and crew. All of Columbia's facilities are are located on the airport's northeast end. Parking for 76 automobiles is available adjacent to the hangars. Figure 2.11 is a photo of one of Columbia Air Service's hangars.

Figure 2.11 – Columbia Air Service, Main Hangar & Office

Lanmar Aviation

Lanmar's facility consists of its original 10,000 square foot hangar now used for aircraft maintenance with an additional 5,000 sq feet of office space and another hangar building accommodating 10 jet-pods on the airport's west side. In 2004, Lanmar completed construction of a 20,000 sq foot hangar primarily for aircraft storage along with 3,750 sq. feet in office,

Figure 2.12 – Lanmar Aviation, Main Hangar & Office

crew and passenger terminal space, and also a new aircraft ramp and parking lot, all on the airport's northeast end (see Figure 2.12, previous page). In 2005, the company constructed a new 36 unit t-hangar facility adjacent to its larger hangar building.

HANGARS

There are a total of nine hangars at GON, eight privately owned and one owned and operated by TASMG. Three of the private hangars are T-units; all remaining hangars are conventional units. The private hangars are used by a combination of recreational and corporate aircraft. The TASMG hangar is a maintenance facility.

All hangars are metal construction and in excellent condition. Our assessment in early February 2008 indicates a surplus of space in both the conventional and t-hangar units.

MAINTENANCE

The maintenance focal point is a 1989 vehicle maintenance and workshop facility, located at the western boundary of the airport. The primary building has two large drive-thru bays, three large vehicle bays, a light mechanical room, a supply closet, an office and second floor crew accommodations (kitchen, restrooms, showers and bunkrooms). This building is used to store and repair snow removal equipment (SRE), mowers, trucks and smaller equipment and hand tools. It is powered in an emergency by a back-up generator. Nearby the building is a vehicle fueling station, a covered 4-vehicle truck port and a heated sand shed. Figure 2.13 is a front photograph of the Maintenance/SRE Storage facility

Figure 2.13 – SRE Storage and Airport Maintenance Building

SNOW REMOVAL

Airport employees are responsible for ensuring safe operations during snow and ice conditions. As directed by the broader Airport Certification Manual, airport snow removal is administered by the Snow and Ice Control Plan.

While some of the fleet is aging, overall the snow removal equipment (SRE) is maintained in excellent condition. Table 2.3 lists airport-owned snow and ice control vehicles.

Table 2.3 – Vehicle / Snow Removal Equipment List

Call Sign	Model	Equipment/User
State 1	4-Wheel Drive	Airport Manager
State 2	4-Wheel Drive	Maintenance Crew Leader
State 3	Pickup Truck with plow	Maintenance
State 4	Mason Dump	9-foot plow with sander
State 9	Payloader	with snow plow
State 10	Snow broom	16' broom with snow blower
State 11	International Snow Fighter	5,000 ton/hour
State 12	International Snow Fighter	23' plow/jet sander
State 15	International Dump Truck	11' plow/sander/spreader

Source: Airport Certification Manual, Attachment A, dated May 5, 2011

AIRPORT RESCUE AND FIRE FIGHTING

Because GON is classified as a commercial service airport (Part 139), it must, by regulation, support Airport Rescue and Fire Fighting (ARFF) operations during commercial air service operations.

The Fire Station and adjacent ARFF Ramp (see Figure 2.14 next page) are almost centrally located on-airport, north of the Central Ramp, and facing the primary runway. The ramp is within full view of the air traffic control tower cab. Opened in 1970, the building is in fair to poor condition. It was constructed with one drive-thru bay, 3 other truck bays all of which are small in size by today's ARFF apparatus standards. There are also an office, 2 restrooms with 1 shower stall, a kitchen/break room and no sleeping quarters. The station houses all airport firefighting equipment and a hazmat supply storage trailer. The 3,600 s.f. facility is heated, but not cooled except for the administrative office area, and does not have a source of back-up power in case of an electrical outage.

There are two vehicles and each one complies with all FAA requirements for ARFF Index A.[8] The following lists the vehicle descriptions; turret capabilities; type and amount of agents required; numbers and types of portable extinguishers; and their current condition.[9]

Rescue 1 – 1998 Emergency One Titan 4x4

- 1,500 gallons of water
- 200 gallons of 3% AFFF
- 550 pounds potassium-based dry chemical power (Purple K)
- 1 portable "ABC" dry chemical extinguisher rated 20 B,C
- Bumper Turret: 300 gallons per minute (GPM)
- Roof Turret: 750 GPM (high flow) and 375 GPM (low flow)
- Condition: Good

Rescue 2 – 2010 Ford/Crash Rescue Equipment Services Renegade

- 300 gallons of water
- 50 gallons of 3% AFFF
- 500 pounds potassium-based dry chemical powder (Purple K)
- 1 portable Halotron extinguisher ABC rated 2A, 10 B,C
- 1 portable "BC" dry chemical extinguisher rated 120 B,C
- 1 portable Class D extinguisher
- Bumper Turret: 150 GPM
- Condition: Excellent (new)

UTILITIES

The airfield is serviced by all essential utilities; water, sanitary, electric, natural gas, and telecommunication lines are connected to the Terminal Building and all other major facilities/businesses on the airport. The conventional hangars, including T-hangars, have electrical power service, and some have water and telecommunications.

Service providers include Groton Utilities (electricity); AT&T (telephone); Town of Groton (water); television/internet service (Comcast).

Electrical service is rated at 9.5 megawatts, with an approximate extra capacity above what is currently used is between 5 and 6 megawatts.[10] Water service is fed from a 20 inch main

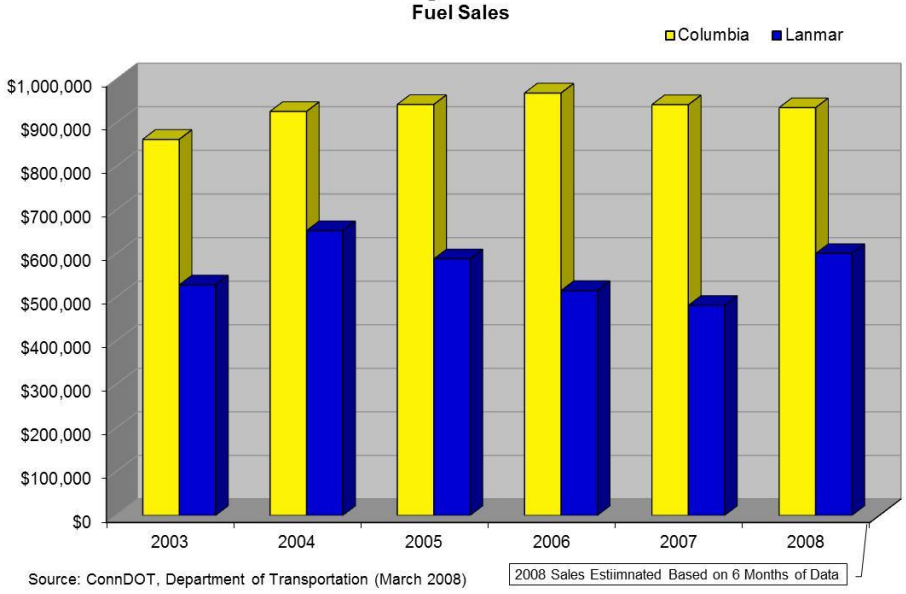
[8] An index is required by 14 CFR Part 139 for each commercial airport certificate holder. The Index is determined by a combination of the length of air carrier aircraft and the average daily departures of air carrier aircraft. There are five indexes, A through E, with A being the minimum index designed to support aircraft less than 90 feet in length.
[9] Groton-New London Airport Certification Manual, Appendix B, dated 7/26/11, FAA approved 8/4/2011.
[10] Personal communications, M. Fedors, Groton Utilities, May 14, 2008.

that is reduced to 10 inches just as it enters airport property near the airport maintenance building.

FUEL SALES

Fuel is currently sold by both fixed base operators, Columbia Aviation and Lanmar Aviation. Columbia sales are by truck, and serviced from a large storage facility located along Tower Avenue at the northwest corner of its leased property. Lanmar sales are by truck and from a self-service terminal located on the airport's General Aviation ramp, between the terminal building and TASMG. Figures 2.5 and 2.6 (pages 9 and 10 respectively) show the location of the two fueling facilities. Figure 2.15 shows the total sales in dollars since 2003 by each of the two fixed base operators.

Figure 2.15
Fuel Sales



AIRSPACE AND AIR TRAFFIC CONTROL

Groton-New London is located within the jurisdiction of Boston Air Traffic Control Center. Instrument Flight Rules (IFR) arrivals and departures are under the control of Providence Approach/Departure Control. The FAA, which controls air operations, operates the Air Traffic Control Tower (ATCT) with contract personnel. The tower is equipped and staffed to provide Visual Flight Rules (VFR) separation of arriving and departing aircraft and control of taxiing aircraft in movement areas (runways and taxiways). The GON tower hours of operation are 7 a.m. to 10 p.m. daily. During closed periods, the airport reverts to "non-towered operations."

As shown in Figure 2.16 (next page), the Groton-New London Airport is located immediately within Class D airspace for the control of aircraft traffic by the ATCT located at the Airport. This airspace is active when the ATCT is operational. The Class D airspace may be described as generally encompassing a five-nautical mile radius of the Airport with

Figure 2.16 – Airspace Structure

a two-nautical mile cutout to allow visual flight rule operations including the VOR or GPS-A circling approach at the Elizabeth Field Airport to the south.

Class D airspace extends from the surface of the earth up to 2,500' above the airport elevation. This translates to 2,509’ above mean sea level (AMSL), rounded to 2,500' AMSL in practice. Aircraft entering this airspace when it is active are required to establish two-way radio communication with the ATCT prior to entry and when within its boundary. This applies to aircraft operating to or from the Airport or transiting the airspace at an altitude of 2,500' AMSL or less. When at an altitude of 2,500' AMSL or above, radio contact with the ATCT is not required. The assigned ATCT frequencies are 125.6 MHz and 352.8 MHz (military use). By federal regulation, aircraft are required to not exceed an indicated airspeed of 200 knots when operating in the Class D airspace. When the ATCT is closed, aircraft utilize the common traffic advisory frequency (CTAF), 125.6 MHz, the same frequency that is used to activate runway and taxiway lights.

Additionally, a larger airspace designated Class E overlies and surrounds the Airport and extends in all directions without specific dimensions. Class E is another form of controlled airspace that is primarily established to enable aircraft transitions to and from the terminal or en route environment. Radio contact with the ATCT is not required when operating

under visual flight rules (VFR) within this classification. When overlying the Class D airspace when it is active, the Class E airspace extends from 2,500' AMSL to 14,500' above ground level (AGL) within its boundary. Otherwise, the floor of the Class E airspace is 700' AGL.

Another form of controlled airspace in the Airport vicinity is Victor airways. These airways are formed by radial headings taken from ground-based navigational aids, the predominant type being the very high frequency omni-directional range (VOR). Victor airways are a form of Class E airspace and extend from 1,200' AGL up to 18,000' AMSL. Their widths are typically eight nautical miles. There are several Victor airways that transit the Airport Class D airspace as also shown in Figure 2.16 (for example V58). It is important to note this because of the location and influence the VOR has at GON; a concept that will be studied in more detail later in this AMPU.

AIRCRAFT ARRIVAL AND DEPARTURE ROUTES

An analysis of aircraft arrival and departure routes, both in visual and instrument conditions are essential because of their influence on noise in and around the airport; a concept addressed later in this section. The arrival and departure routes that follow are general based on ATC observations[11] and known visual and instrument flight patterns. The accuracy of the routes depicted becomes less precise the further aircraft are from the airport. The purpose of the routes is to help develop noise contours later in this study.

AIRCRAFT ARRIVAL ROUTES

Aircraft operating VFR and seeking to arrive at the Airport may fly any route that affords them entry into the Class D airspace. Once cleared by the ATCT, aircraft are typically instructed to enter the traffic pattern on the downwind leg for the active runway, although straight-in procedures may be authorized depending on the extent and type of air traffic activity at the time. The traffic pattern altitude for the Airport has been established at 1,000' AMSL for light aircraft and 1,500' AMSL for turbojet and all turbine-powered aircraft. The traffic pattern flown is generally rectangular in shape and all turns are standard left-hand.

Aircraft operating under instrument flight rules (IFR) are vectored to the final approach course associated with the instrument procedure by Providence Approach Control (125.75 MHz or 319.2 MHz) and control is then transferred to the Groton ATCT. The aircraft is then cleared for the final approach to land. When the ATCT is closed, Providence Approach Control will clear the aircraft for the instrument approach and the pilot must initiate appropriate radio procedures to report his position and intentions to aircraft that may be in the vicinity of the Airport. Providence Approach Control is operational daily between

[11] Routes verified by C. Moore, ATC Tower Chief.

6:45 a.m. and 1:00 a.m. When closed, Boston Approach and Departure Control provide IFR clearances and may be contacted at 124.85 MHz. Figure 2.17 is a graphic showing arrival routes, developed for noise purposes, which will be addressed in a later working paper.

> Note: On Figure 2.17 (next page) and 2.18 that follows on page 29, the numbers refer to the arrival or departure runway. The letters are used to code the arrival and departure sub routes for the noise modeling that will be developed later in this study.

When the ATCT is active, there is a ground control frequency (121.65 MHz) to direct taxiing aircraft to and from the runway and terminal areas. IFR aircraft arriving after the ATCT is closed can close their flight plan via the remote communications outlet (RCO) linked to the Bridgeport Flight Service Station. This a major convenience and safety factor inasmuch as there is no need to cancel an IFR flight plan in the air prior to the landing and allows the pilot to maintain radio contact with air traffic controllers until the aircraft has stopped at its parking position. This enables the air traffic controller to clear other aircraft for the approach to the Airport because the safe arrival of the preceding aircraft can be confirmed. Otherwise, the landing pilot must exit the aircraft and telephone the air traffic controller, which consumes considerable time and effectively closes the Airport to aircraft arrivals. The RCO frequencies are 122.1 MHz to receive and 110.85 MHz to transmit.

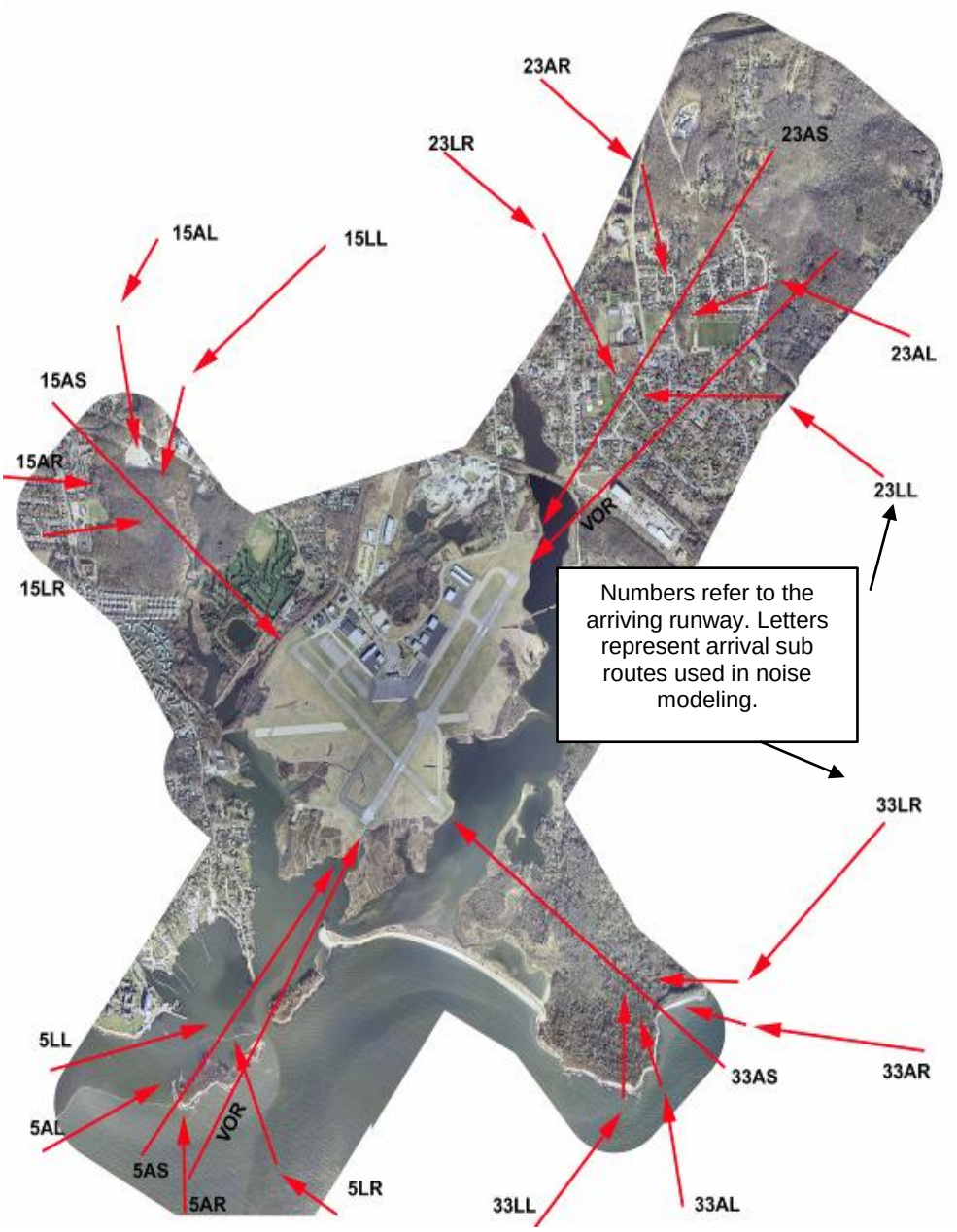
AIRCRAFT DEPARTURE PROCEDURES

There is no standard instrument departure procedures published for IFR aircraft taking off from the Airport. IFR aircraft obtain departure clearances through the ATCT, or when closed, through RCO linked to the Bridgeport Flight Service Station. Once cleared for takeoff by the ATCT or otherwise airborne, IFR aircraft communicate with Providence Approach Control or Boston Approach and Departure Control as specified in its clearance. VFR aircraft departures follow instructions from the ATCT when active or apply standard procedures for an uncontrolled airport. Notwithstanding these practices, there are noise abatement and other operational procedures that aircraft are requested to abide by on a voluntary basis. These are reviewed in the section that follows. A graphic showing departure routes for noise purposes can be found on Figure 2.18 (next page).

INSTRUMENT APPROACH PROCEDURES

There are six instrument approach procedures (IAP) serving GON, based on the ILS, VOR, and GPS. There are procedures to Runway 5, 23, and 33. These procedures include:

- ILS or Localizer Approach Runway 5. Uses ground based ILS system located along Runway 5-23.
- GPS procedures to Runways 5, 23, and 33. Uses satellite based navigation.
- VOR procedure to Runway 5 and 23. Uses the VOR located on the airport.


23AR
23LR
23AS
15AL
15LL
23AL
15AS
15AR
23LL
VOR
15LR
Numbers refer to the arriving runway. Letters represent arrival sub routes used in noise modeling.
33LR
5LL
33AS
33AR
5AL
VOR
5AS
5AR
5LR
33LL
33AL

It is important to note that the GPS procedures are non-precision and as of this date, have not been evaluated for an upgrade to the newer Localizer Performance with Vertical Guidance (LPV) procedure.

Graphics of each IAP along with a general descriptive page are contained in Appendix 3 of this document.

AIRCRAFT OPERATING PROCEDURES

Runway 5-23, because of its length, instrument approach capabilities, approach lighting system, and preferable wind patterns, is the preferred runway. The Airport is located in a noise-sensitive area and has adopted voluntary procedures that emphasize 'fly-friendly' policies. These policies include published procedures that pilots are encouraged to follow when operating in visual flight conditions. During instrument flight conditions pilots must follow air traffic control directions. Specific procedures include:

- Runway 5 departures – Turn left heading 020º until reaching 1,000' AMSL, then on course;
- Runway 23 departures – Turn left heading 210º until south of Pine Island, or upon reaching 1,000' AMSL, then on course (see Figure 2.18, next page);
- Runway 33 departures – Fly runway heading until reaching 1,000' AMSL, then on course;
- Touch-and-go operations – Not permitted between the hours of 10:00 pm and 6:00 a.m., daily; and
- Practice approach / full stop / touch-and-go landings prohibited by pure jet aircraft and aircraft weighing 12,500 pounds and over, except by written approval from the Connecticut Bureau of Aviation.

NEIGHBORING AIRPORTS

The nearest airport to Groton-New London Airport is the Elizabeth Field Airport, located about five nautical miles to the south-southeast on Fishers Island. This is a general aviation airport with two relatively short runways, neither greater than 2,400 feet, in a northwest-southeast and a northeast-southwest alignment. A circling approach based on the Groton VOR/DME with GPS overlay is published. Aircraft over fly the VOR/DME at an altitude of 2,000' AMSL and therefore are transiting the Class D airspace assigned to the Airport when the ATCT is in operation. The Elizabeth Field Airport is a base for two aircraft and total aircraft operations are estimated at 2,125 annually; about half of which are conducted by air taxi operators that serve the community. The Airport is attended during the months of May through October, generally between the hours of 8:00 a.m. and 8:00 p.m. There is sufficient airspace between the airports to afford minimal, if any, interaction between arriving and departing aircraft.

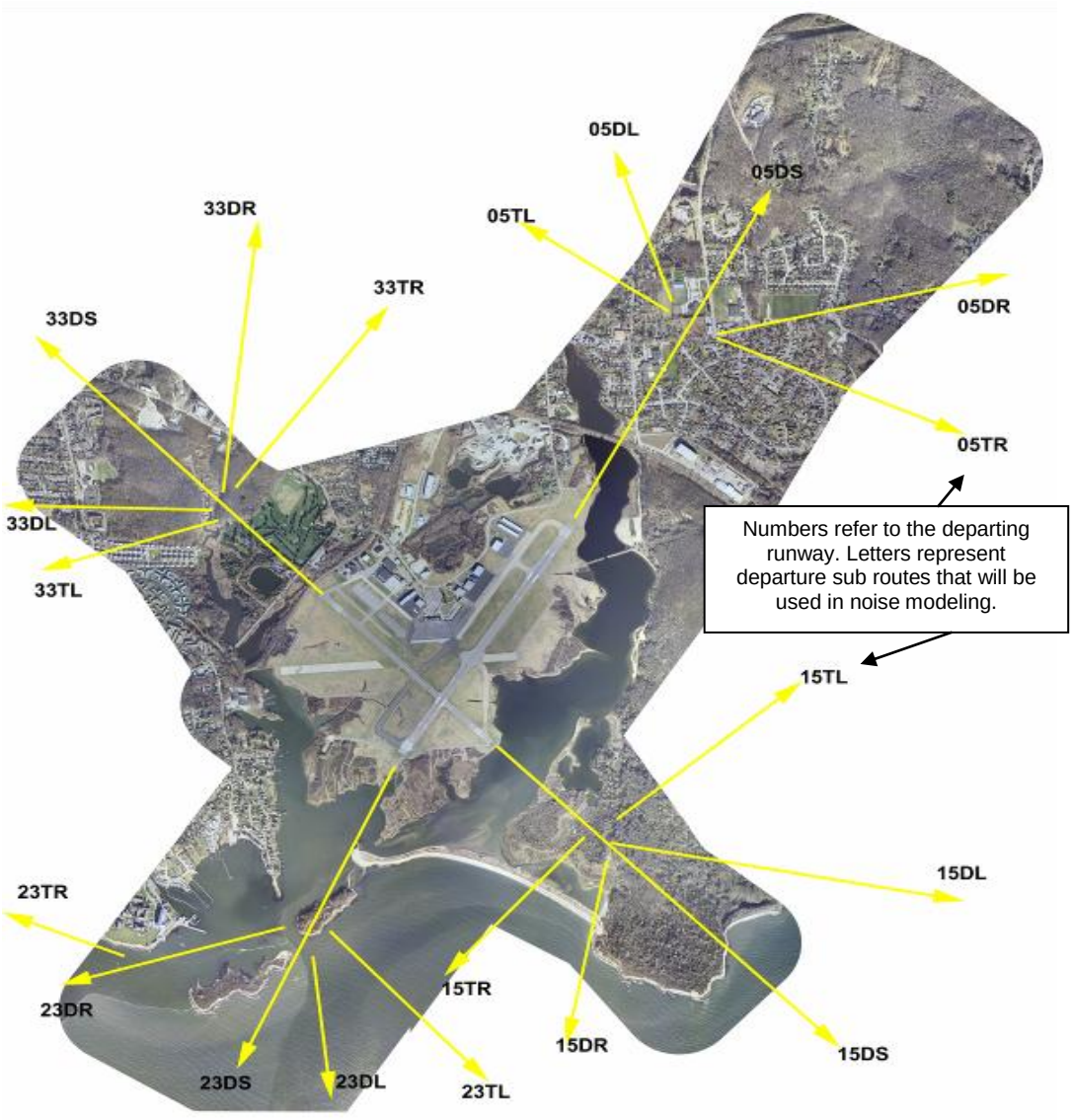


Figure 2.18 – Departure Route Tracks

Four other area public-use airports[12] are located between 11 nautical miles and 23 nautical miles from the Groton-New London Airport. These are general aviation airports served with instrument approach procedures, but none over fly the Groton-New London Airport Class D airspace. The airspace allocated to these airports is sufficiently large to preclude interaction among aircraft activity conducted at these facilities and the Groton-New London Airport.

AIRPORT ACCESS AND VEHICULAR PARKING

The access route to and from GON and Interstate 95 has changed little since the last AMPU in 1999. The route uses Exit 87 from I-95 to U.S. Route 1, then via Poquonnock Road to High Rock Road, then Tower Avenue, which serves as the main feeder road to all airport facilities and services. This route is very congested because of Route 1 and its extensive commercial development that has only increased since the last update.

At-grade public parking is provided on-airport at no charge for passengers, visitors, and employees. On-airport parking consists of 245 parking spaces with eight handicap spaces. The parking lot is in fair condition and of adequate size to meet current demand. However, some spaces in the lot flood during high tide and heavy rainstorms. In the fall of 2001, new lighting, which included new poles, bases, conduit, and wire, was installed in the lot.

Parking at the two opposite ends of the airport is not as plentiful. TASMG, with its high employee concentration has expanded parking since the last AMPU. The organization is currently developing its own master plan and will look at potential expansion in the future.[13] On the opposite end, Columbia Air Services with 76 spaces, and Lanmar Aviation with space for 60 automobiles, both need extra parking. However, with the surplus of space at the terminal, split between the two FBOs and TASMG, the airport overall has plenty of space, and is a short walk to either end of the terminal area.

RECENT DEVELOPMENT

The most significant recent development at GON since this report was started is the construction of full Runway Safety Areas (RSA) on Runway ends 5 and 23 using Engineered Material Arresting System (EMAS) technology, a crushable concrete installed as a bed at each end of the runway. EMAS was installed in lieu of a standard turf safety area because of space limitation. Refer to Figures 2.5 and 2.6 presented earlier on pages 9 and 10.

- The Runway 5 departure end (Runway 23 approach) EMAS is set back 245 feet from the threshold. The pad is 130 feet long and 162 feet wide.

[12] Westerly State Airport; Block Island State Airport; Montauk Airport; Chester Airport
[13] Telephone conversation with LCOL Scott Panagrosso, September 15, 2008.

- The Runway 23 departure end (Runway 5 approach) EMAS is set back 35 feet from the threshold and is 340 feet long and 162 feet wide.

HISTORIC AND CURRENT AVIATION ACTIVITY

This part addresses aircraft activity (operations and based aircraft). Operations refer to the actual takeoff and landing of aircraft (one operation for each separate event). A based aircraft is an aircraft that is "operational and air worthy", which is typically based at the airport for a majority of the year. For this AMPU three categories of aircraft operations (commercial, general aviation, and military) as well as the based aircraft that use GON as the home field, comprises aviation activity analyzed. All four (commercial, general aviation, and military operations, as well as based aircraft) are strong indicators of trends, which are used in developing forecasts in Chapter 3 of this report.

Operations are further divided into itinerant and local. Local operations begin and end at the airport and by definition remain within 20 miles of the airport during this period. Local operations are usually those aircraft that remain in the local air traffic pattern for the purpose of practice and/or flight training. Itinerant operations are those that do not remain in the local pattern. Lastly, operations are also divided into instrument flight rules (IFR) and visual flight rules (VFR). For air traffic reporting purposes, itinerant operations are classified as either IFR or VFR, while local operations are only VFR. For traffic count purposes an air carrier aircraft is considered to be an aircraft capable of carrying more than 60 passengers. Air taxi is those commercial operations not classified as an air carrier aircraft.[14] As Table 2.4 on the next page illustrates, the majority of commercial operations at GON are air taxi for traffic reporting purposes.

Table 2.4 (page 34) shows operations during the 18-year period from 1990 through 2007 as reported by air traffic control tower personnel for the period the tower is open (7 am to 10 pm daily).[15] This table breaks the operations data out into itinerant and local, and is further divided into air carrier, air taxi, military, and general aviation. Note that local operations only include general aviation and military[16]. For illustration purposes, Figure 2.19 (next page) presents itinerant versus local operations, which is currently 61 percent itinerant and 39 percent local.

Table 2.5 (page 34) is the breakout of IFR and VFR operations (where IFR only includes itinerant operations, and VFR includes both itinerant and local).

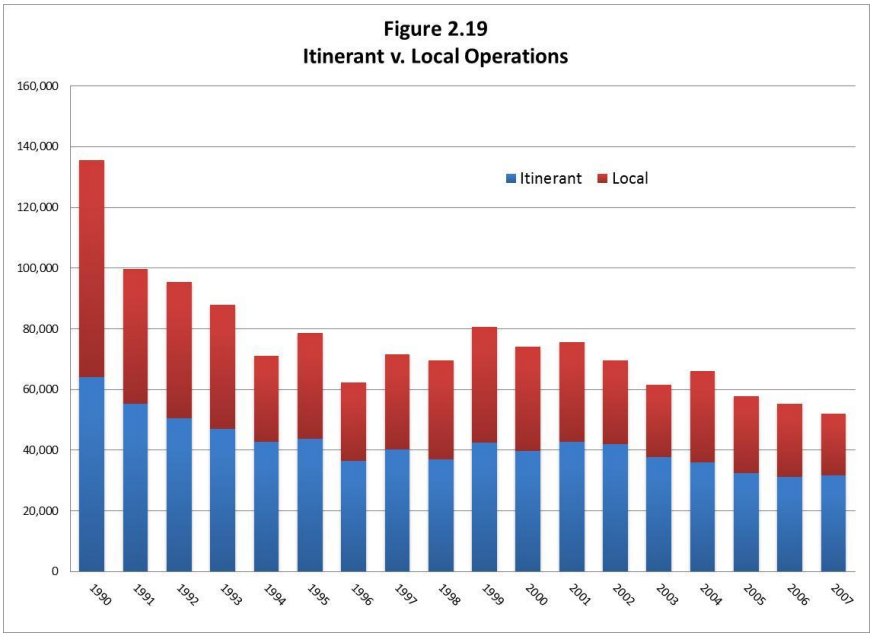
[14] As reported by the air traffic control tower, which reports aircraft operations data according to FAA Order JO 7210.3V, Facility Operation and Administration, February 14, 2008.
[15] A night differential will be added later in this report for noise reporting purposes.

COMMERCIAL OPERATIONS

Commercial operations mean any operation involving the carriage of people and/or cargo for hire. This includes air carrier (schedule and non-scheduled), air taxi and charter operations (see Appendix 1). A more detailed explanation can be found in Appendix 2.

While airline service ended in September 2003, other commercial service (air taxi and charter) continue at GON. Prior to the loss of airline service the airport averaged 5,000 annual commercial operations. Since the loss of air carrier service in 2003, the airport has averaged slightly less than 2,800 commercial operations. Presumably, the difference is because of the termination of air carrier service.

Figure 2.19
Itinerant v. Local Operations



A review of commercial operations shows a steady decline since 1990 when the airport reported over 14,000 operations. During the period from 1990 to 1994, commercial operations declined by 58 percent, from 14,431 to 6,048 operations. Flights slightly increased for the next three years, then started a slow steady decline through 2007. Figure 2.20 (page 35) shows commercial operations (air carrier, air taxi and charter operations) during the period 1990 through 2007. Commercial operations during the base year (2007) total 2,446.

GENERAL AVIATION OPERATIONS

The primary activity at GON is general aviation, and like commercial operations, this segment has shown a steady decline in numbers. However, this is a nation-wide trend and does not necessarily reflect abnormal movement or conditions at GON. Steady rising fuel prices and insurance costs are the primary reason. Inflationary issues have also impacted the cost of aircraft, aircraft parts, maintenance, and flight training.

Table 2.4 - Historic Aircraft Operations

Year	Itinerant Operations					Local Operations			Total Operations
	Air Carrier	Air Taxi	General Aviation	Military	Total	General Aviation	Military	Total	
1990	0	14,431	46,561	3,122	64,114	68,218	3,333	71,551	135,665
1991	0	10,428	41,445	3,364	55,237	41,357	3,132	44,489	99,726
1992	0	9,285	37,069	4,237	50,591	39,754	5,058	44,812	95,403
1993	0	7,692	36,180	3,185	47,057	38,505	2,420	40,925	87,982
1994	2	6,027	34,596	2,236	42,861	26,687	1,582	28,269	71,130
1995	1	6,459	34,404	2,792	43,656	32,876	2,048	34,924	78,580
1996	1	6,604	27,325	2,610	36,540	23,627	2,186	25,813	62,353
1997	0	6,982	30,763	2,377	40,122	29,441	1,972	31,413	71,535
1998	0	5,862	29,309	1,877	37,048	30,712	1,778	32,490	69,538
1999	0	4,751	35,739	2,108	42,598	35,796	2,194	37,990	80,588
2000	0	4,342	33,199	2,123	39,664	32,693	1,876	34,569	74,233
2001	6	4,312	36,258	2,131	42,707	31,018	1,852	32,870	75,577
2002	3	3,574	35,534	2,763	41,874	24,804	2,850	27,654	69,528
2003	4	3,869	32,000	1,875	37,748	22,395	1,318	23,713	61,461
2004	0	3,079	30,695	2,292	36,066	28,254	1,692	29,946	66,012
2005	4	2,711	26,999	2,711	32,425	23,517	1,950	25,467	57,892
2006	2	2,437	25,869	2,906	31,214	22,200	2,003	24,203	55,417
2007	0	2,446	26,217	3,021	31,684	18,662	1,614	20,276	51,960

Source: FAA Air Traffic Activity System (ATADS) (September 26, 2008)

Table 2.5 - IFR v. VFR Operations

Year	IFR	VFR	Total
1998	9,367	60,173	69,540
1999	10,047	70,544	80,591
2000	10,037	64,198	74,235
2001	11,409	64,170	75,579
2002	10,789	58,739	69,528
2003	11,860	49,601	61,461
2004	10,676	55,337	66,013
2005	9,762	48,159	57,921
2006	8,990	46,247	55,237
2007	9,610	42,350	51,960

Figure 2.20
Commercial Operations

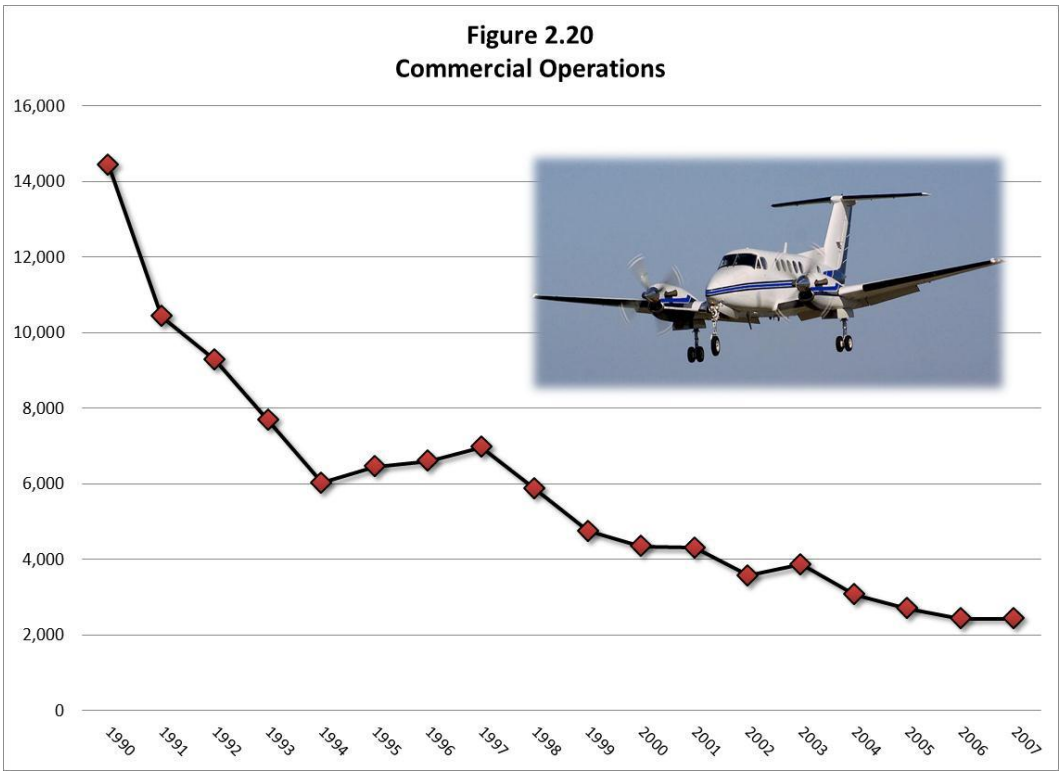
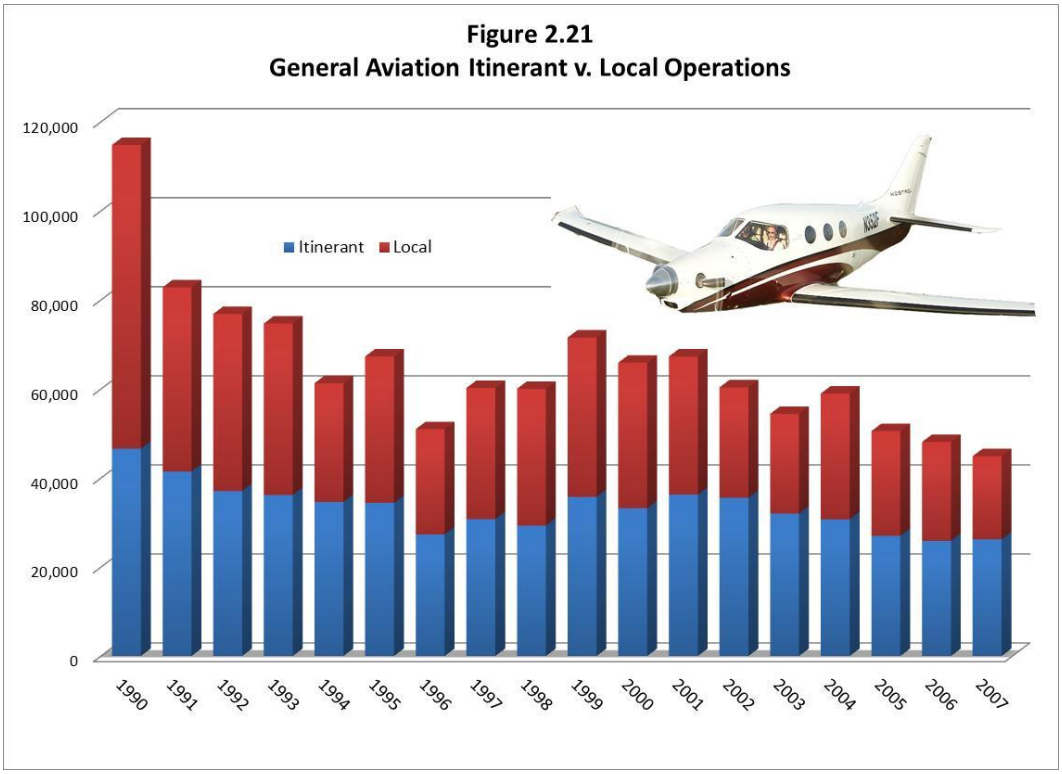


Figure 2.21
General Aviation Itinerant v. Local Operations



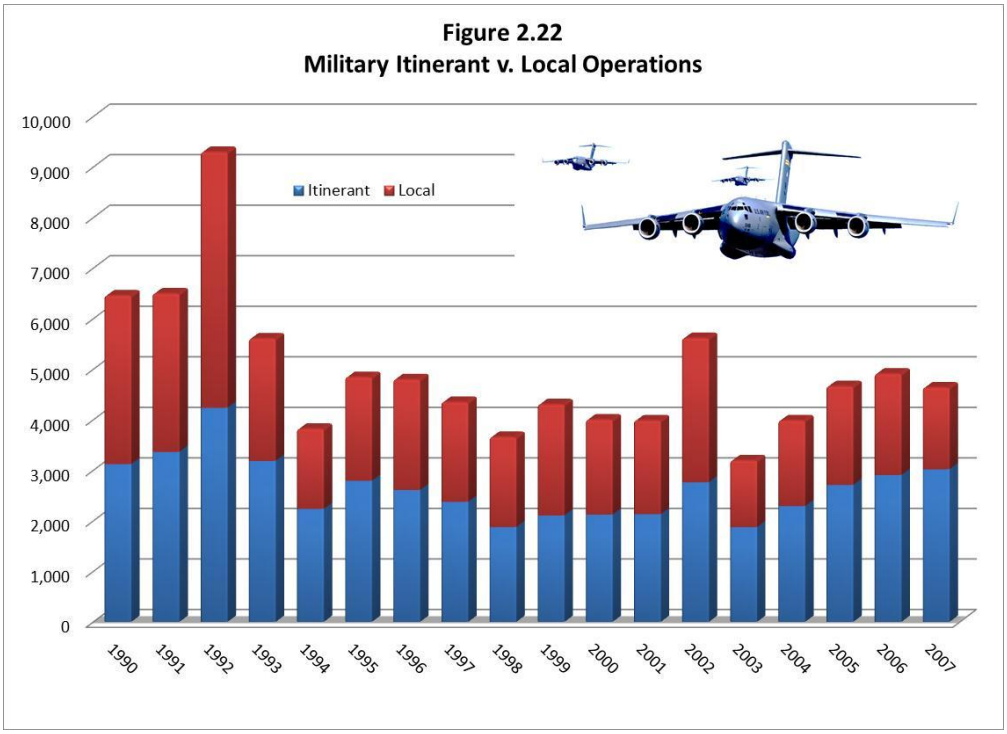
General aviation operations are divided into two categories; local and itinerant (see Appendix 1). And like commercial operations, general aviation activity in the past 14 years was at its peak in 1990 when the airport reported almost 115,000 local and itinerant operations. This number declined rapidly until 1994, where it increased slightly for the next three years, then slowly declined through 2007 to just under 45,000; a 69 percent decline since 1990.

Figure 2.21 (on the previous page) shows a comparison of itinerant and local general aviation activity at GON. This data shows that the 2007 base year numbers reflect 58 percent of general aviation operations in 2007 were itinerant (26,217) and the remaining 42 percent (18,662) are local operations.

MILITARY OPERATIONS

Military activity at GON is from a variety of sources including: Local operations conducted primarily by Army National Guard 1109th TASMG and also the U.S. Air Force Auxiliary Civil Air Patrol which has squadron offices on-airport; and Itinerant operations either in support of the National Guard or aircraft using GON for practice approaches (from military airfields in New England and along the eastern seaboard); VIP flights associated with the nearby U.S. Naval Submarine Base – New London and the U.S. Coast Guard Academy in New London; and the U.S. Coast Guard International Ice Patrol whose operations center is located in New London and whose flights involve C-130 aircraft operations February through July using U.S. Customs services.Figure 2.22 shows military operations for the period 1990 through 2007.

Figure 2.22
Military Itinerant v. Local Operations



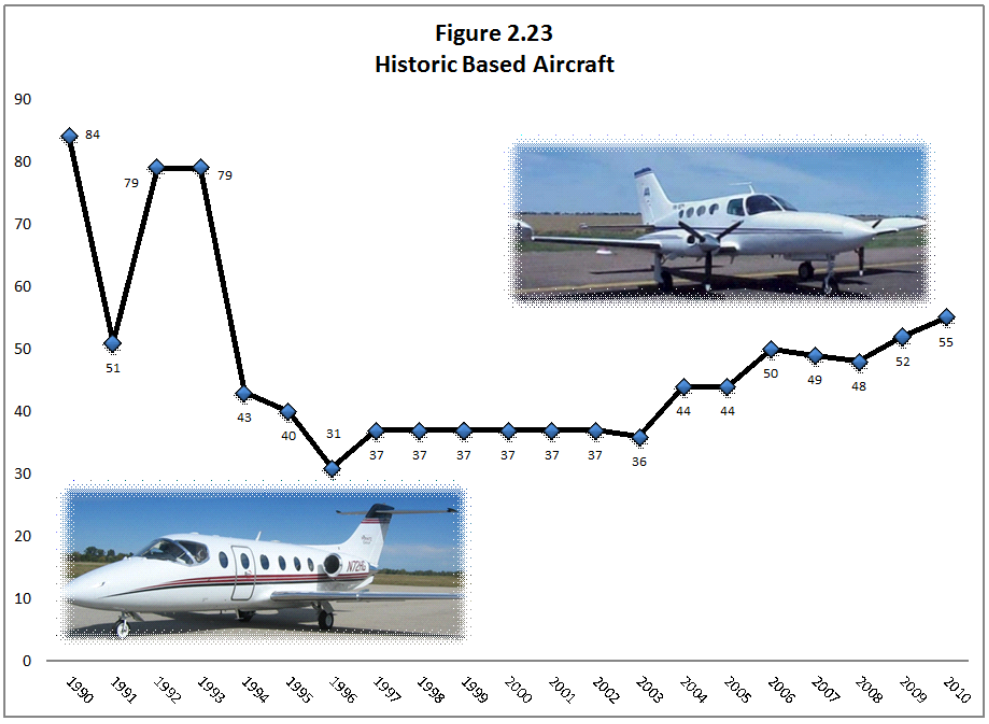
BASED AIRCRAFT

Based aircraft are measured as a future forecasting tool to assess airport services and infrastructure needs. Based aircraft at GON have averaged 54 aircraft during the 27 year period from 1980 through 2006 (last reported year). However, this number has decreased significantly since 1993. For the period from 1980 through 1993, based aircraft averaged 69 aircraft; since then, the average fell to as low as 39, but has been steadily increasing to its base year number of 55. Construction in 2004 and 2005 of the new jet pods and T-hangars has undoubtedly contributed to some of the increase in based aircraft.

One issue that is difficult to determine is the number of TASMG aircraft that are based at GON on a temporary basis. In reality, military airplanes have no bearing on the based aircraft forecasts because they are really not "true" based aircraft. The number of military fixed-wing and helicopter aircraft parked at GON changes almost on a daily basis. As the master plan develops and alternatives are developed, where and how civil aircraft are parked (apron or hangar) will be one of the issues this master plan studies. TASMG is currently developing their own master plan and will determine how much space the guard unit will need in the planning years. For the purposes of this master plan it is virtually impossible for to determine what TASMG future needs are until they finish their study, primarily because their needs will not be impacted by the forecasts develop in this master plan.

Figure 2.23 presents the reported totals for base year in 2010, data provided by the airport manager in 2011. As illustrated in Figure 2.24 (next page), the base year fleet-mix consists of 67% single-engine reciprocating, 14% multiengine reciprocating, 4% helicopter and 15% jet/turbofan.

Figure 2.23
Historic Based Aircraft



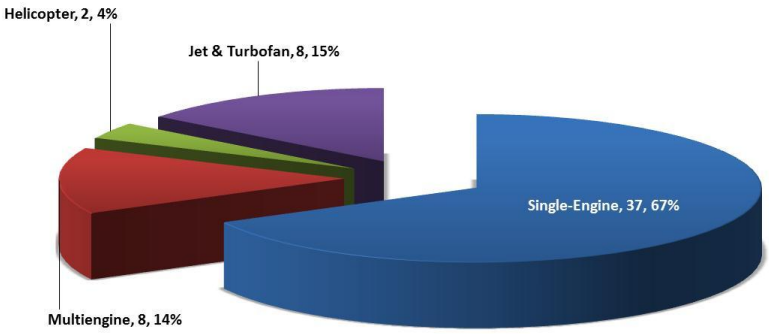


Figure 2.24
Based Aircraft Fleet Mix

AIRCRAFT AND OPERATIONS INVENTORY SUMMARY

Table 2.6 summarizes the aircraft and operations summary for the base year 2010. This is the baseline data for the master plan update, which will be used in forecasting future airfield requirements.

Table 2.6 - Aircraft and Operations Inventory Summary

Operations	Commercial	General Aviation	Military	Total
Itinerant	2,300	28,000	3,100	33,400
Local	0	18,600	1,500	20,100
Total	2,300	46,600	4,600	53,500

Based Aircraft

Single-Engine	Multiengine	Helicopter	Jet & Turbofan	Total
37	8	2	8	55

Design Aircraft		Airport Reference Code
Runway 5-23	Citation 650	C-II
Runway 15-33	Beech King Air 200	B-II

ENVIRONMENTAL OVERVIEW

This master plan update will perform an environmental overview that will identify projects that will need further analysis if the project were to move forward. It does not include an Environmental Assessment or Environmental Impact Statement.

CONSULTATION WITH ENVIRONMENTAL AGENCIES

Coordination letters were sent to the United States Fish & Wildlife Service and the Connecticut Department of Energy and Environmental Protection (CTDEEP) to identify the potential presence of endangered and/or threatened species or species of special concern in the area of the airport. In addition, preliminary coordination with the Connecticut State Historic Preservation Office (SHPO) regarding the potential for cultural resources was implemented and a preliminary response received (see next paragraph). Figure 2.25 shows the airport location, with cross-hatching that indicates that threatened or endangered species or species of special concern are present in the area based on the CTDEEP NDDB GIS database.

We do know that prehistoric archaeological sites 59-5 and 59-18 are located on airport property and as such, indicate a moderate to high archaeological sensitivity that would warrant additional archaeological studies prior to future ground disturbance.

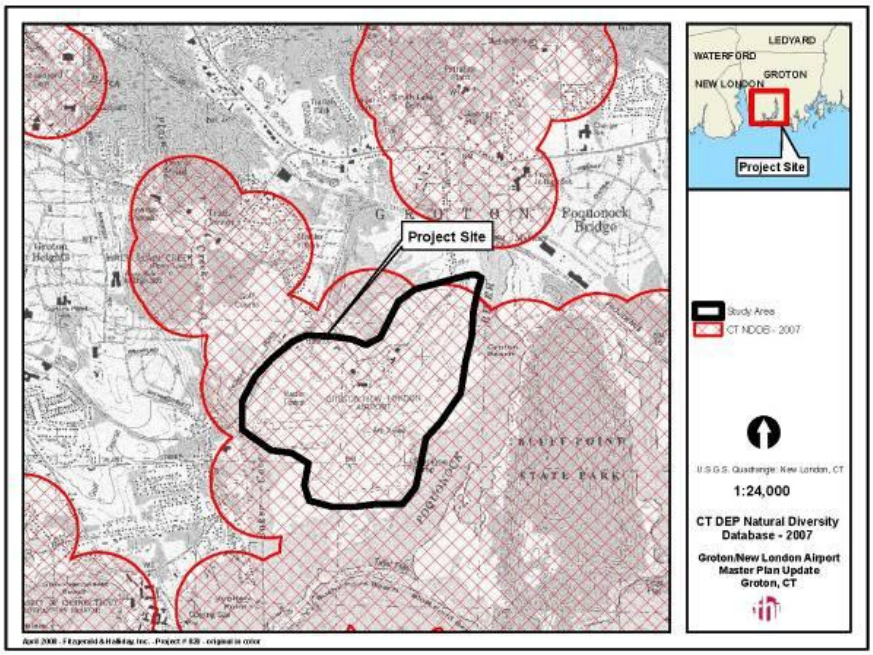


Figure 2.25 – Threatened and Endangered Species Locations

In addition to the above, separate reports were prepared independent of this update and are noted as additional sources of information. These include the following:

- *Ornithological Surveys and Habitat Assessments*, Prepared July 2007 by Mark S. Szantyr under contract with Parsons Corporation.

- *Rare Plant Survey and Plant Community Classification,* Prepared September 2007 by William H. Moorhead III under contract with Parsons Corporation.
- *Groton-New London Airport Safety Improvements to Runway 5-23 Endangered Specie Mitigation Plan*, DOT Project 58-303 Mitigation Plan, Prepared by CTDOT Office of Environmental Planning, April 2009.
- *Soil/Wetland Delineation Report*, Prepared July 2007 by Parsons Corporation.

LAND USE – ON AIRPORT

The Groton-New London Airport is located in the Town of Groton and abutting the boundary with the City of Groton. The airport is on a peninsula and all of the land on the airport property is occupied for aircraft related uses with the exception a pocket of undeveloped shrub lands northwest of Tower Avenue/South Road. Runways and taxiways occupy the southern tip and eastern half of the airport property with one generally northeast/southwest runway and one southeast/northwest runway. These runways and adjacent taxiways abut waterways including Baker Cove and the Poquonnock River. The northwest corner of the airport includes hangars, aircraft parking and related buildings, including maintenance buildings, charter facilities, aircraft sales, safety and rescue training facilities, and a Connecticut National Guard complex. Figure 2.5, presented earlier on page 9, is a current aerial photo of the airport, followed by the airport layout plan, Figure 2.6 on page 10. The airport includes:

- One NNE-SSW runway 5,000 feet long and 150 feet wide
- One NNW-SSE runway 4,000 feet long and 100 feet wide
- ATCT and approach lighting
- 2.5 miles of taxiways
- 16 acres of paved aircraft parking area
- 14 buildings for various uses

LAND USE – OFF AIRPORT

The existing Groton-New London Airport is situated on the eastern end of the Connecticut coast at Long Island Sound and is surrounded on the southwest, south and east by Baker Cove, the Sound and the Poquonnock River respectively. Land just to the northwest of airport property is the 40 acre privately owned Airport Business Park that encompasses over 800 acres and provides public–access to Bushy Point Beach. The park is designated a coastal reserve and is only accessible via non-motorized vehicles or on foot. The City of Groton lies immediately to the west and land uses adjacent to the airport in the City are predominantly single-family residents, including the Jupiter Point neighborhood. Other land uses to the west are, the University of Connecticut at Avery Point on the Avery Point peninsula, the Shennecossett Beach Club and Golf Course. Land to the north of the airport

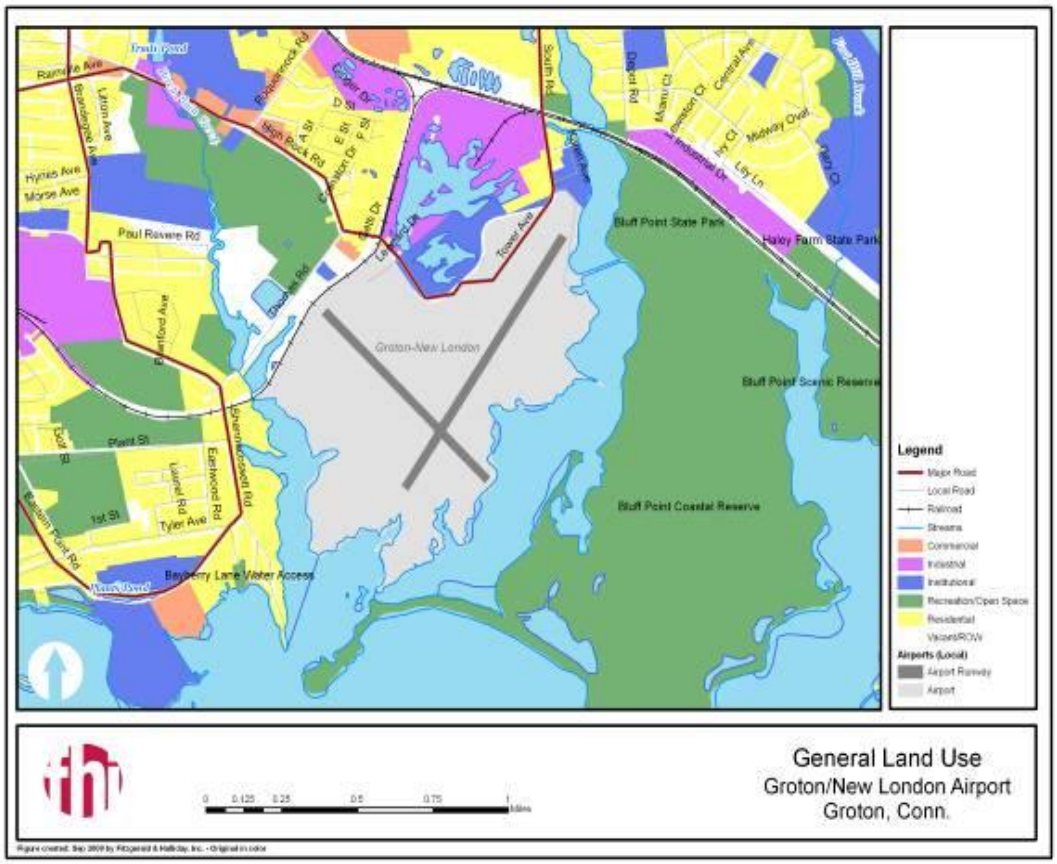


Figure 2.26 – General Land Use Map

is a mix of activities typical of long-established urban and suburban communities including Pleasant Valley Mobile Home Park with approximately 240 homes. Development abutting the airport to the north and northwest is predominantly industrial, including a rail line, but with residential subdivisions further north. Other uses of note in the vicinity include a town ball field and boat launch to the northeast of the airport, several schools, a daycare, a cemetery and several places of worship. Figure 2.26 shows generalized land uses in the airport vicinity.

DEVELOPMENT POLICIES

The airport falls within the planning regions addressed by

- the State Conservation and Development Policies Plan for Connecticut (2005-2010) (the C&D Plan);
- the Regional Plan of Conservation and Development 2007 for the Southeastern Connecticut Council of Governments (SCCOG); and

- Groton 2002 Plan of Conservation and Development (Groton Planning Commission). These plans each articulate a vision, goals, and objectives for future land use and overall development within their respective planning regions. Relevant key elements of these reports are summarized below.

The C&D Plan contains growth management, economic, environmental quality, and public service infrastructure guidelines and goals for the State of Connecticut. It contains six "growth management principles" intended to better integrate a variety of state planning functions. The overall strategy of the C&D Plan is to reinforce and conserve existing urban areas, to promote appropriate, sustainable development, and to preserve areas of significant environmental value. The Location Guide Map which accompanies the C&D Plan provides a geographical interpretation of the State's conservation and development policies.

According to the C&D Plan's Development Location Guide Map, the Groton-New London Airport peninsula falls within a Conservation Area with Neighborhood Conservation areas to the north and west and Preservation Areas to the south and east. Typically, the Conservation Areas are "planned for the long-term management of lands that contribute to the state's need for food, water and other resources and environmental quality by ensuring that any changes in use are compatible with the identified conservation value." The Neighborhood Conservation areas are significantly built-up and well populated areas but without the infrastructure, density, and diverse income characteristics of an urban based regional center. The state strategy for a Neighborhood Conservation Area is to maintain these stable communities and support intensification of development when "supportive of community stability and consistent with the capacity of available urban services". Finally, Preservation Areas are intended to protect significant resource, heritage, recreation, and hazard-prone areas by avoiding structural development, except as directly consistent with the preservation value.

The Regional Plan of Conservation and Development 2007 for southeastern Connecticut includes a map of proposed future land use based on policies defined in the plan text. The Groton-New London Airport peninsula is identified as an area of "Existing Institutional Uses" and is proposed to remain in that use. It is surrounded by "Existing and Proposed Urban Uses" except for the state park which is categorized as "Existing Recreation and Open Space Uses". The areas of institutional use in the plan include public and private institutional uses that are expected to remain such as "governmental, military, correctional, educational and medical facilities". The plan's urban areas are recommended for "the most intensive residential and/or industrial and commercial development". These areas include the region's urban centers as well as concentrations of intensive development in village and town centers. The plan states that "where feasible, these areas should be looked to for the location of compact, transit accessible, and pedestrian-orientated mixed use". Recreation and open space areas in the plan include existing preserved open space such as Bluff Point State Park which should remain as such in the future.

The SCCOG Regional Plan of Conservation and Development 2007 conclude with a set of goals, objectives, and recommended actions. Transportation-related goals, objectives, and recommendations include:

- **Goal** - Create a balanced regional transportation system that strives to meet the needs of all segments of the population, including tourists, regardless of age, income or disability, and which promotes responsible development within the region's core.
- **Objective 3** - Regional transportation systems, which are planned and budgeted for within the context of fiscal constraint
- **Recommended Action 10** - Support actions to improve service levels and the use of Groton-New London Airport.

The most recent plan of conservation and development for the Town of Groton is the Groton 2002 Plan of Conservation and Development. It is organized around a series of themes including conservation, development, and infrastructure. The transportation system is addressed as part of the infrastructure theme. The overarching goal is to enhance the transportation system. The plan notes that, as of 2002, "the airport is recognized as an underutilized asset and the airline operations there have not been well developed." It also notes that "While the airport continues to provide a valuable service to area residents and businesses, activities at the airport tend to be controversial since about half of its operations involve flight paths over residential areas. Due to the potential impacts (both positive and negative) on local residents and businesses, activities at the airport should be closely monitored." Recommendations relative to the airport include:

- Continue to closely monitor activities at the airport due to the potential impacts (both positive and negative) on local residents and businesses.
- Undertake partnerships with the airport and CTDOT to enhance the economic potential of the airport facilities.

ZONING

According to the Town of Groton zoning map (October, 2003), the Groton-New London Airport falls entirely within the industrial IA-40 Zone. The IA-40 zone has a minimum lot size requirement of one acre (or 40,000 square feet) with a maximum building coverage of 40 percent. The principle intended uses in this zone include a full range of industrial, warehousing, and manufacturing activities. Airports are a permitted use in this district. Zoning districts in the airport environs are shown in Figure 2.27 (next page).

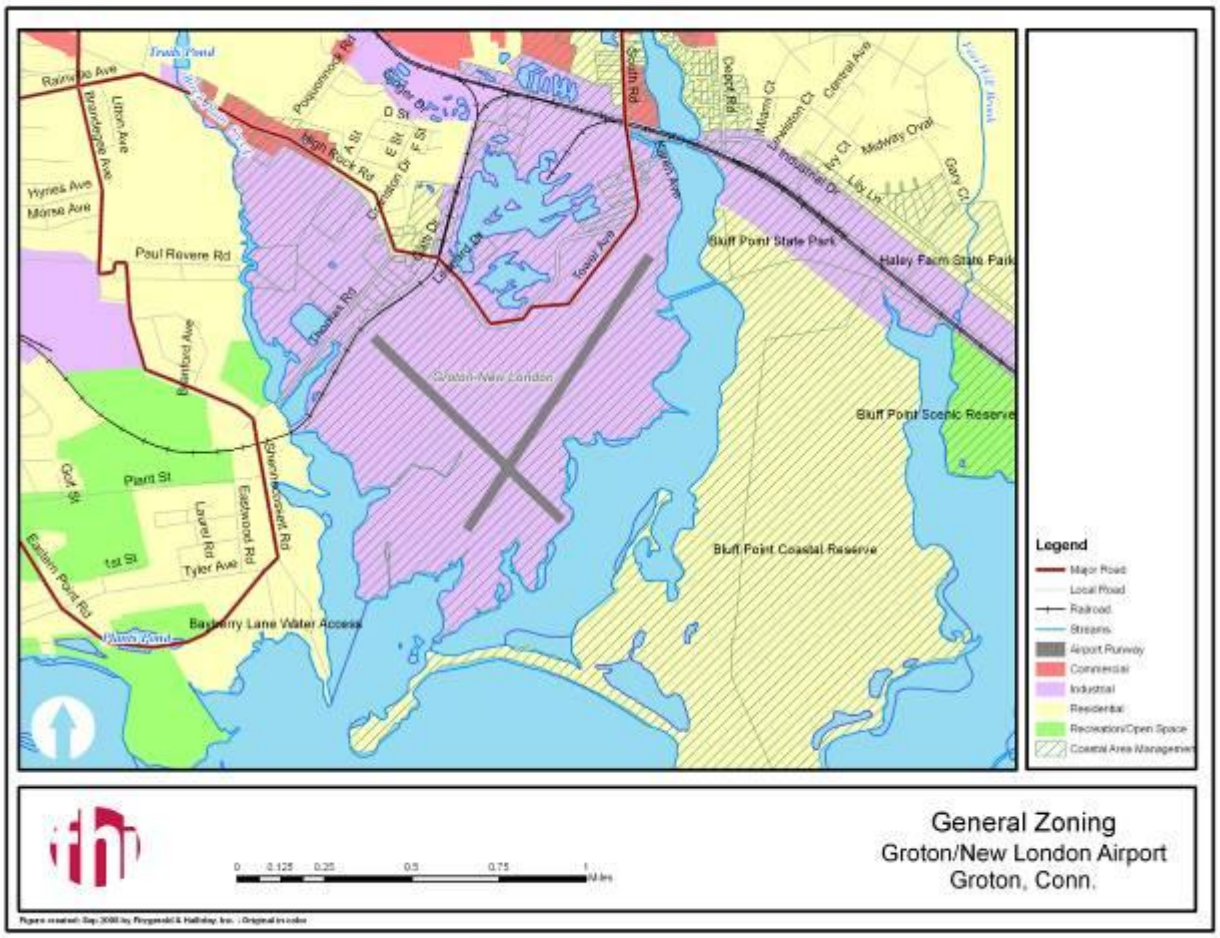


Figure 2.7 – General Land Use Map

FINANCIAL DATA

An examination of the airport's financial resources, including its basic business model, operating revenue and expenses, and sources and use of capital funds is included in this section.

The Groton-New London Airport's business model is based on a general aviation facility; which by definition generates revenue from a wide-range of recreational and business aircraft operations. Instead of receiving income from airline ticket counters and ramp/apron leasing, the airport generates revenue from sources such as land leases for businesses and hangars, fuel flow fees, tie-down fees, landing fees from corporate aircraft, and rental car agency fees. Like most general aviation airports, GON must offset expenses through sponsor derived funding, in this case the CTDOT. As the data that follows shows, airport revenues have increased and the costs have decreased in the prior five years The

primary reason for this increase comes from rent on land and buildings, where the change equals a 378 percent increase over five years. In addition, the airport is financially supported by the State's Transportation Fund and in the case of approved AIP projects, the FAA, with a 95 percent federal and five percent sponsor cost sharing.

Table 2.7 shows revenue and expense summaries for the period fiscal year 2002 through 2007.

Table 2.7 - Airport Revenue and Expense Summary

	FY 02-03	FY 03-04	FY 04-05	FY 05-06	FY 06-07
Revenue	$276,932	$389,748	$443,018	$408,801	$668,543
Expenses	$966,721	$805,920	$682,305	$770,376	$758,790
Operating Surplus/Deficit	($689,789)	($416,172)	($239,287)	($361,575)	($90,247)

Source: CT Department of Transportation, Bureau of Finance and Administration, May 26, 2008